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R+L HYDRAULICS

HYDRAULIC COMPONENTS · POWER TRANSMISSION · OIL COOLERS



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DIN EN ISO 9001:2000
Zertifikat-Nr. 71100 E251

BMA 0010 **Instruction and Installation Manual** **Oil-Air Cooler ACN**

- Compact oil-air cooler
- High cooling capacity
- High operating pressure
- Low pressure loss
- Low noise emission

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1. Basic information

1.1 Notes on this Instruction and Installation manual

Please read the installation manual carefully before installing and operating the ACN oil-air cooler; pay particular attention to the safety instructions. The Instruction and Installation Manual is part of your product. Keep the Manual in a safe place in the vicinity of the ACN oil-air cooler. Property rights to this Instruction and Installation Manual remain with R+L HYDRAULICS GmbH.

1.2 Accuracy at time of going to press

We reserve the right to make technical amendments and alterations to reflect the current state of development. The ACN oil-air cooler described here represents the current state of the art at the time this Instruction and Installation Manual went to press.

1.3 Intended purpose

The intended purpose of the ACN oil-air cooler is the cooling of hydraulic fluid (mineral oil, HFC (polyglycol > 40%), HFD) in industrial plants and systems.

1.4 Warranty and liability

Unauthorised technical modifications to the ACN oil-air cooler are prohibited. Any such modifications are made entirely at the customer's risk and exclude the manufacturer from any warranty claims or liability.

1.5 Guarantee and claims

Please contact your R+L HYDRAULICS Partner in the event of any faults or breakdowns. R+L HYDRAULICS accepts no liability for any consequential loss or damage resulting from unauthorized repairs and/or modifications carried out by the customer.

1.6 Kontaktdaten

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2. Safety

2.1 Standards and directives

The ACN oil-air cooler is 'partly completed machinery' under the terms of the EU Directive 2006/42/EC.

By applying standard DIN EN ISO 12100:2011-03 during design and construction of the ACN oil-air cooler, the manufacturer has taken into account the general requirements regarding safety and ergonomics.

2.2 Safety instructions – graphic design and form



DANGER

Warns of an accident that will occur if instructions are not followed. The accident will cause serious, possibly life-threatening injuries or death e.g. by coming into contact with high-voltage electrical units.



WARNING

Warns of an accident that can occur if instructions are not followed. The accident may cause serious, possibly life-threatening injuries or death e.g. by coming into contact with high-voltage electrical units.



CAUTION

Warns of an accident that can occur if instructions are not followed. The accident can lead to light injuries such as burns, skin damage or crushing.



CAUTION

Warns of possible material damage.



NOTICE

Important general information



NOTICE

Important information about environmental protection

2.3 Symbols used



High voltage, danger of electrocution



Danger, handle with care: flammable materials



Cross-reference "see Section 'xx', page yy"

2.4 Warning labels



Danger, hot surfaces



Hearing protectors must be worn

2.5 General safety instructions

- The company operating the ACN oil-air cooler must ensure compliance with all requirements concerning use for the intended purpose.
- The operator is responsible for preventing adverse influence on the component materials by chemicals in the immediate environment of the cooler.
- If the ACN oil-air cooler is used as part of a larger plant, the plant operator is responsible for compliance with all workplace health and safety requirements and with any additional national regulations in the country concerned.
- "Safety first" should always be top priority when carrying out adjustments or maintenance work on the ACN oil-air cooler.

3. Description

3.1 Sub-assemblies and options

The main sub-assemblies of the ACN oil-air cooler are the radiator, the housing with mounting points and the fan sub-assembly, consisting of fan, protective grid and motor (↗ see Appendix Fig. 1 and 2). The fan sub-assembly for sizes ACN 70 to ACN 100 also contains the motor console used for attaching the motor to the housing (↗ see Appendix Fig. 3)

ACN oil-air coolers are available with one- or three-phase electric motors; detailed motor data can be found on the motor nameplate.

Optional thermostat switches are available; these can be screwed into the radiator and activate the fan automatically when the system temperature reaches a certain level. The necessary motor controls must be installed beforehand.

Under normal operating conditions, the noise emission level of oil-air coolers of sizes ACN 5 to ACN 100 is between 61dB(A) and 84dB(A) +/- 3dB(A). These values can be exceeded if the device is installed in an unfavourable location or operated under extreme conditions.

For general information on dimensions and technical data ↗ see Appendix, Section "Technical Data and Dimensions".

3.2 Nameplate

Every ACN oil-air cooler is fitted with a nameplate containing the following data (↗ see Appendix Fig. 4) and located on the top of the housing:

- Article name
- Article number
- Serial number
- Delivery date
- Max. operating pressure, static
- Max. operating pressure, dynamic
- Max. operating temperature

4. Installation of the oil-air cooler



CAUTION

Risk of crushing! To avoid accidents and injuries when lifting, use only the appropriate hoisting equipment and procedures. Ensure that the hoisting machinery and equipment used are in perfect working order and approved for the weight of the oil/air cooler!

4.1 Installation site

When selecting the installation site, please ensure that it will have no adverse effects on the function of the ACN oil-air cooler and that draughts or noise will not inconvenience or harm personnel. Air inlets and outlets must not be covered or blocked at any time, so that cooling air can circulate freely. Recirculation of hot air (exhaust) must be avoided. Please ensure that the distance between the cooler and the nearest wall is equal to or larger than the height of the cooling package. (↗ see Appendix Fig. 5)

Installation in enclosed spaces

When the equipment is installed in enclosed spaces, adequate ventilation must be provided so that the warm air produced by the heat exchange process does not increase the temperature in the room. If adequate ventilation cannot be provided, air ducts must be installed between the ACN oil-air cooler and the outside air, allowing air to be sucked directly into the cooler and provide the ventilation required.

Outdoor installation

The increased viscosity of oil at low ambient temperatures must be taken into consideration when installing the heat exchanger outdoors. This can lead to increased dynamic pressure and system overload when starting from cold, so we recommend the installation of a bypass valve controlled by pressure or temperature if the cooler is installed outdoors. As an alternative, a thermostatically controlled oil heating system with permanent oil circulation through the ACN oil-water cooler can be fitted.

Installation in dirty environments (spaces)

Installing the heat exchanger in environments with heavily contaminated air results in dirt deposits on the cooling fins. As this reduces the cooling performance, the equipment must be cleaned regularly when installed in environments strongly contaminated with dust or oil (↗ see Appendix Fig. 8. Cleaning).

4.2 Installation position and orientation

The installation position does not affect the function of the ACN oil-air cooler. However, only the mounting points provided should be used (↗ see Appendix Figs. 6–8).

ACN 5:	front mounting flange
ACN 10–60:	Foot brackets or front mounting flange
ACN 70–100:	Foot brackets or front mounting flange

4.3 Electrical connections



DANGER

Risk of electrocution! Electrical equipment must be installed and connected to the mains by a qualified electrician!



DANGER

Risk of electrocution! Ensure that the device is not connected to the mains electricity supply during installation!



CAUTION

Check mains voltage and frequency! To avoid damage to the ACN oil-air cooler or electrical systems, always compare the information regarding mains voltage and frequency given on the motor nameplate before connecting the oil-air cooler to the mains and.



WARNING

Overload protection! Electric motors must be properly protected against overload in accordance with the customary technical rules and national regulations.

4.4 Hydraulic connections



WARNING

Connection must be free of tension and vibration! To prevent damage to the radiator, all hydraulic connections should be free of tension or vibration. R+L HYDRAULICS recommends the use of suitable hydraulic lines or compensators for the connection of the ACN oil-air cooler.

The oil-side connection of the ACN oil-air cooler is effected using the marked connection threads or flanges provided on the upper and lower collection tanks of the radiator (↗ see Appendix Fig. 11 + 12). The connection not in use is sealed with a sealing plug before leaving our factory.

The connecting pipes G 3/8" and M22 x 1.5 (ACN 5 – ACN 60) or G 1" (ACN 70 – ACN 100) are intended for the installation of measuring sensors or switches (↗ see Appendix Fig. 13).

5. Commissioning and start-up



CAUTION

Risk of injury! Before operating for the first time, check that the ACN oil-air cooler has been installed and connected correctly.

Commissioning and start-up procedure:

- Please ensure that:
 - ⇒ the ACN oil-air cooler is complete and none of the components show signs of damage.
 - ⇒ the ACN oil-air cooler has been connected correctly.
 - ⇒ the fan can rotate freely and without obstruction - a simple test is to turn the fan by hand. To prevent obstruction or damage to the fan blades, ensure that there is nothing protruding through the fan guard.
 - ⇒ all screw-in oil connections have been sufficiently tightened.
 - ⇒ the housing of the ACN oil-air cooler is free of foreign objects.
- Turned on the oil supply and check the hydraulic connections for possible leaks.
- In the event of a leak, retighten the screw connections; if necessary, replace the connections.
- Start the electric motor. Check that the fan is rotating in the direction of the arrow on the housing.
- If a three-phase motor is fitted and the fan is rotating in the wrong direction, reverse the terminal connections.
- Listen carefully for any unusual noises or vibration.
- Unusual noises or vibration indicate that the fan or drive motor may be damaged. Damaged components must be replaced immediately (↗ see Appendix Section 9.2 Dismantling the electric motor and fan).

6. Operating the unit



CAUTION

Risk of burns or scalding! The ACN oil-air cooler can become very hot when in operation, so always allow ample time for the radiator to cool down before touching it. We recommend the installation of a guard to prevent accidental contact.

Please ensure that the following maximum permissible values/limits are not exceeded during operation.

Max. oil temperature:	120 °C
Max. ambient temperature:	40 °C
Max. operating pressure:	26 bar static / 20 bar dynamic
Max. power consumption:	see motor nameplate

7. Maintenance

7.1 Regular maintenance work

The user/operator should check the following items at regular intervals to ensure that the ACN oil-air cooler continues to function properly and safely:

- Noise and vibration:
Unusual noises or vibration indicate that the fan or drive motor may be damaged. Damaged components must be replaced immediately. (↗ see Appendix Section 9.2 Dismantling the electric motor and fan)
- Correct mounting:
Loose or missing mountings must be tightened or replaced.
- Soiling of the radiator:
Dirt on the radiator will reduce cooling performance and may be an indication of leaks, so the radiator must be cleaned regularly. (↗ see Section 8.1 Cleaning the radiator)

- Oil-tightness of the radiator:
Oil leaks can endanger the environment and constitute a risk to human health, so any leaky screw connections must be tightened or replaced. If oil is leaking from the radiator itself, the radiator must be replaced. (↗ see Section 9.1 Dismantling the radiator)
- Warning labels:
Warning labels must not be damaged or removed. Any defaced or missing labels must be replaced immediately.

7.2 Yearly inspections:

The electrical installations must be checked by a suitably qualified electrician once a year.

8. Cleaning



DANGER

Risk of electrocution! Always disconnect the ACN oil-air cooler from the mains electricity supply during cleaning, especially when water or other liquids are used.



CAUTION

Risk of injury! Always switch off drive motor before cleaning and ensure that it cannot be switched on again inadvertently.



CAUTION

Risk of burns or scalding! The ACN oil-air cooler can become very hot when in operation, so always allow ample time for the radiator to cool down before touching it. We recommend the installation of a guard to prevent accidental contact.

8.1 Cleaning the radiator

The radiator may be cleaned with compressed air or water. If the radiator is extremely dirty, it can also be cleaned with water using a high-pressure cleaner. The water jet must be directed lengthwise along the fins to avoid damaging them. Add a cleaning agent to the water if necessary, but please ensure that the cleaning agent used is compatible with aluminium. Oil and grease deposits can be washed off with hot water. Always cover the motor during cleaning and ensure that the radiator is cold when cleaning it with water.

8.2 Cleaning the inside of the cooler housing

The radiator must be removed in order to clean the inside of the cooler housing (see Section 9.1 Dismantling the radiator). As a rule, cleaning the cooler housing with compressed air at is sufficient. To prevent dust and dirt from entering the motor, we recommend directing compressed air through the protective grid from the motor side. Particularly stubborn dirt can be removed using a degreaser.

9. Dismantling and assembling the sub-assemblies

9.1 Dismantling the radiator

R+L Hydraulics accepts no liability for consequential damage caused by unauthorised repairs and/or modifications carried out by the user/operator.



CAUTION

Risk of injury! Always switch off drive motor before dismantling the radiator and ensure that it cannot be switched on again inadvertently.



CAUTION

Risk of burns or scalding! The ACN oil-air cooler can become very hot when in operation, so always allow ample time for the radiator to cool down before dismantling.



CAUTION

Risk of crushing! To avoid injuries caused by the radiator falling, always secure it before loosening the fixing screw.

Procedure for dismantling the radiator (see Appendix Fig. 14):

- Turn the system off.
- Switch off fan motor and ensure that it cannot be restarted inadvertently.
- Make sure that the system is not under pressure.
- Shut off oil supply to the cooler.
- Remove cooler inlet and outlet pipes.
- Empty radiator completely.
- Remove the screws fixing the radiator to the housing.
- Remove the radiator.

Procedure for assembling the radiator:

- Refit radiator
- Attach the radiator to the housing with the screws provided. Secure screws with Loctite blue or similar liquid thread locker.
- Attach cooler inlet and outlet pipes to the radiator.
- Connect motor to the electricity supply.

9. Dismantling and assembling the sub-assemblies

9.2 Dismantling the electric motor and fan

DANGER

Risk of electrocution! Ensure that the unit has been disconnected from the mains electricity supply and the electrical wiring is current-free before dismantling des electric motor!

CAUTION

Risk of burns or scalding! The ACN oil-air cooler can become very hot when in operation, so always allow ample time for the radiator to cool down before dismantling the electric motor.

ACN 5

Procedure for dismantling the electric motor (↗ see Appendix Fig. 15):

- Turn off the unit and ensure that it is completely disconnected from the mains electricity supply.
- Disconnect wiring to and from the motor.
- Remove screws fastening the protective grid to the frame.

Procedure for installing the electric motor:

- Fasten protective grid to housing with screws and washers. Secure screws with Loctite blue or similar liquid thread locker.
- Connect motor to the mains electricity supply.
- For subsequent procedures, see Section 5. "Commissioning and start-up".

ACN 10 – ACN 60

Procedure for dismantling the electric motor (↗ see Appendix Fig. 16):

- Turn off the unit and ensure that it is completely disconnected from the mains electricity supply.
- Disconnect wiring to and from the motor.
- Secure the motor.
- Remove screws fastening the protective grid to the frame.
- Remove fan unit - consisting of protective grid, fan and motor – from the cooler housing.
- Remove locking screw at the front end of the motor shaft.
- Remove fan from motor shaft, using a puller if necessary.
- Release locking screws between protective grid and motor.
- Remove protective grid.

Procedure for installing the electric motor:

- Attach protective grid to the motor.
- Fasten protective grid to the motor with screws provided. Secure screws with Loctite blue or similar liquid thread locker.
- After lightly greasing the motor shaft, fit the fan on the shaft, using a spacer ring if necessary.
- Securely fasten fan to front end of motor shaft using screw and suitable washer(s).
- Attach fan unit – consisting of protective grid, fan and motor – to cooler housing.

- Fasten protective grid to housing with screws and washers. Secure screws against loosening with Loctite blue or similar liquid thread locker.
- Check that the fan is centred in its housing and able to rotate freely. If necessary, slightly loosen screws between protective grid and housing, then realign protective grid.
- Connect motor to the mains electricity supply.
- For subsequent procedures, see Section 5. "Commissioning and start-up".

ACN 70 – ACN 100

Procedure for dismantling the electric motor (↗ see Appendix Fig. 17):

- Turn off the unit and ensure that it is completely disconnected from the mains electricity supply.
- Disconnect wiring to and from the motor.
- Secure the motor.
- Release the screws fastening the protective grid to the housing.
- Release the screws fastening the motor console to the housing.
- Remove fan unit – consisting of protective grid, fan, motor console and motor – from the cooler housing.
- Remove locking screw at the front end of the motor shaft.
- Remove fan from motor shaft, using a puller if necessary.
- Remove protective grid.
- Remove screws fastening the motor console to the motor.
- Remove motor console.

Procedure for installing the electric motor:

- Attach motor console to motor.
- Fasten motor console to motor with screws provided. Secure screws with Loctite blue or similar liquid thread locker.
- Lay protective grid on motor console.
- After lightly greasing the motor shaft, fit the fan on the shaft.
- Securely fasten fan to front end of motor shaft using screw and suitable washer(s). Secure screw against loosening with Loctite blue or similar liquid thread locker.
- Attach fan unit – consisting of protective grid, fan, motor console and motor – to the housing.
- Securely fasten motor console to housing with screws and washers. Secure screws against loosening with Loctite blue or similar liquid thread locker.
- Securely fasten protective grid to housing with screws and washers. Secure screws against loosening with Loctite blue or similar liquid thread locker.
- Check that the fan is centred in its housing and able to rotate freely. If necessary, slightly loosen screws between motor console and housing and realign motor console.
- Connect motor to the mains electricity supply.
- For subsequent procedures, see Section 5. "Commissioning and start-up".

APPENDIX

Illustrations & diagrams

Fig. 1:
Sub-assemblies ACN-5

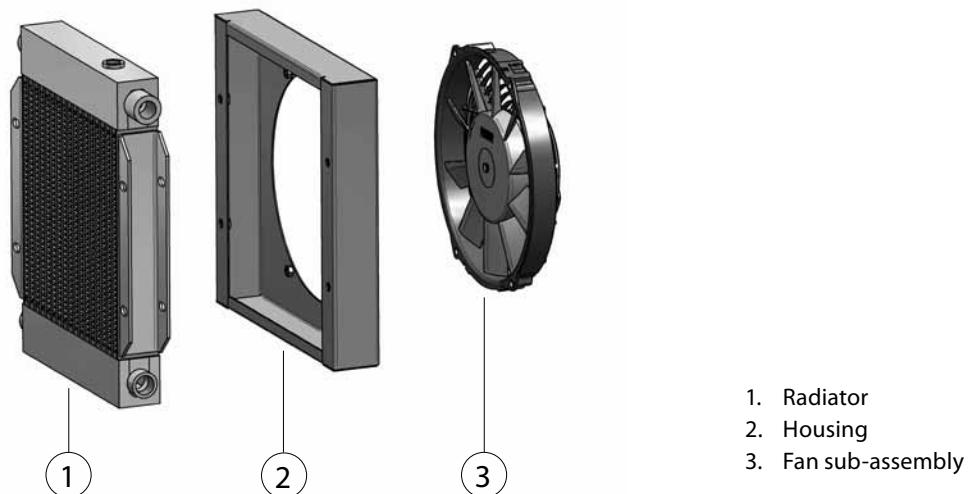


Fig. 2:
Sub-assemblies ACN-10 – ACN-60

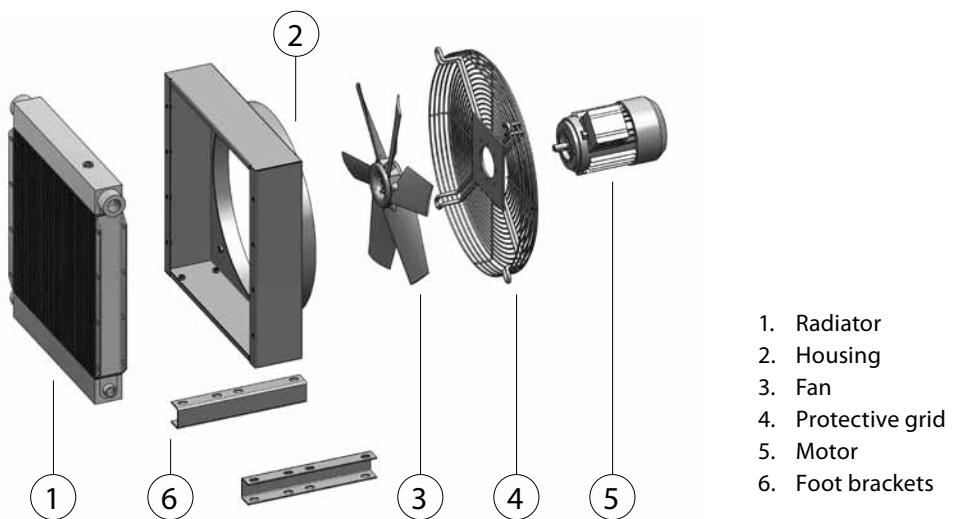
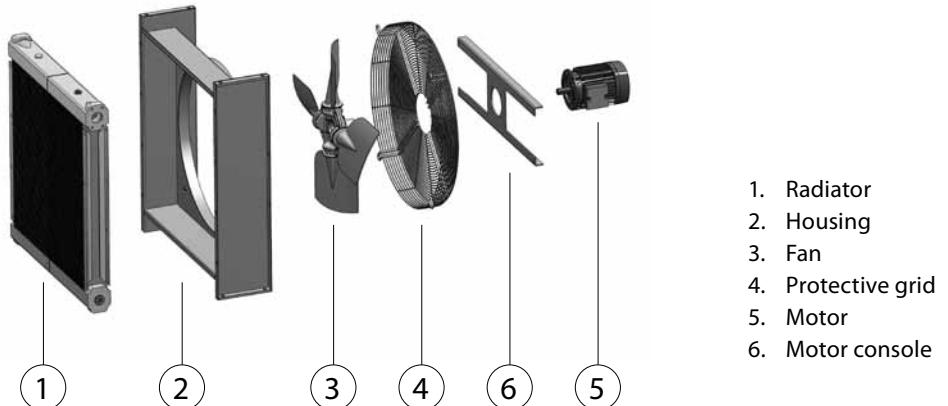


Fig. 3:
Sub-assemblies
ACN-70 – ACN-100



Illustrations

Fig. 4:
Nameplate



Fig. 5:
Required clearances

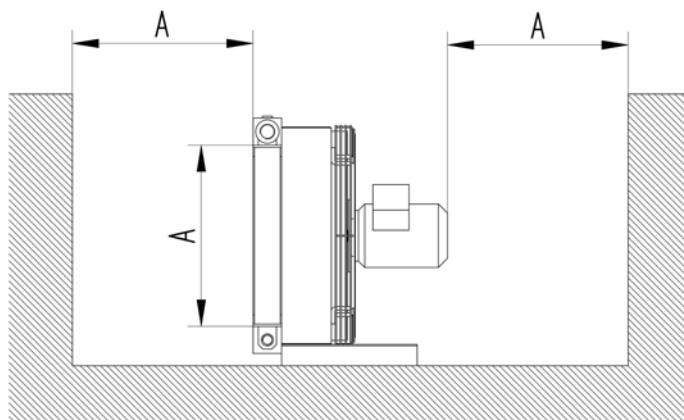


Fig. 6:
Sub-assemblies
ACN-70 – ACN-100

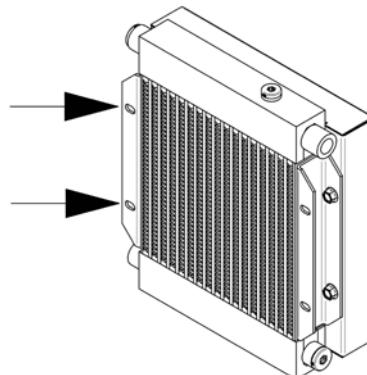
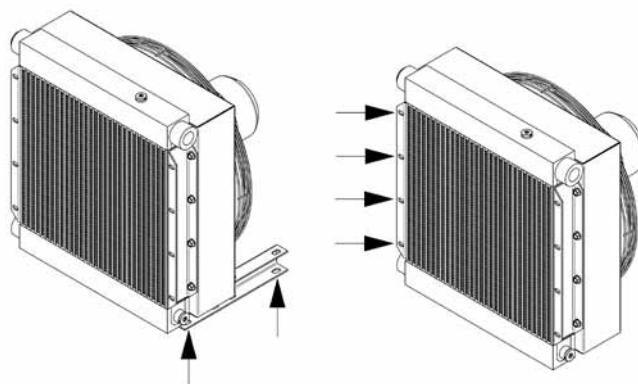


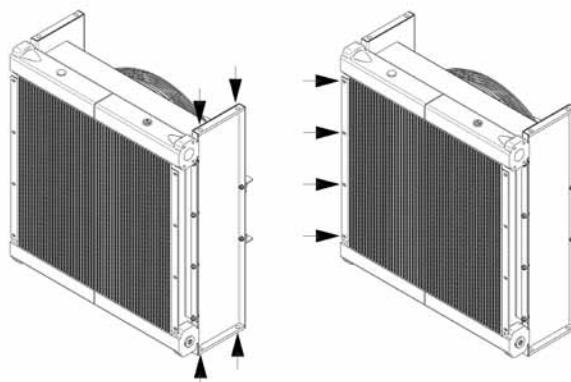
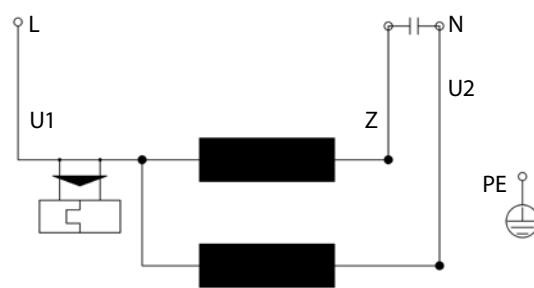
Fig. 7:
Mounting points
ACN-10 – ACN-60



Illustrations

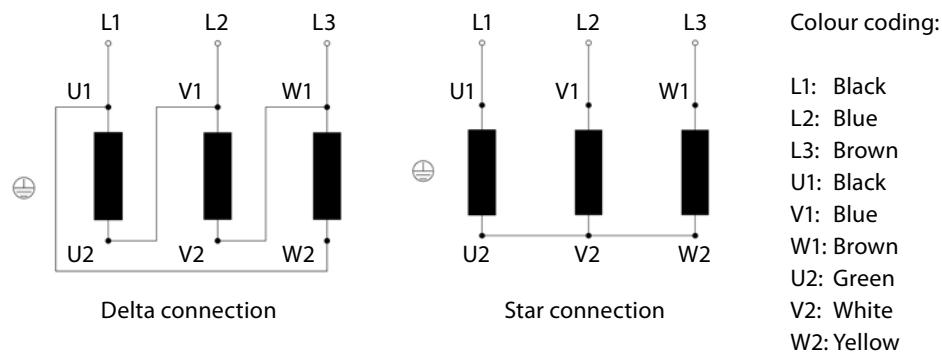
Fig. 8:

Mounting points ACN-70 – ACN-100

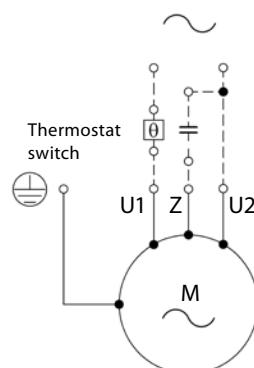
**Fig. 9a:**Electrical connections ACN-5
(230V 50Hz, one phase)

Colour coding:

U1: Blue
Z: Brown
U2: Black
PE: Green/yellow

Fig. 9b:Electrical connections ACN-5
(230/400V 50Hz, three phases)

Colour coding:
L1: Black
L2: Blue
L3: Brown
U1: Black
V1: Blue
W1: Brown
U2: Green
V2: White
W2: Yellow

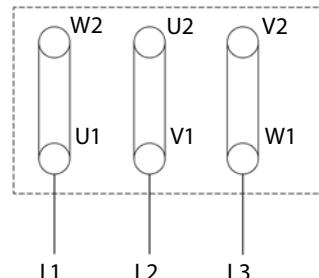
Fig. 10a:Electrical connections
ACN-10 – ACN-60 (230 V 50 Hz, one phase)

For terminal assignment,
please refer to label in motor
terminal box

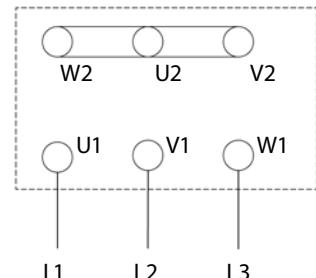
Illustrations

Fig. 10b:

Electrical connections ACN-10 – ACN-100
(230/400V 50Hz, three phases)



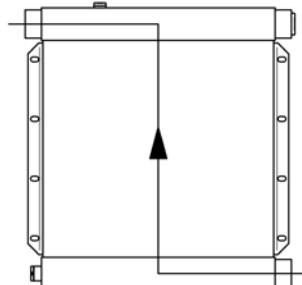
Delta connection



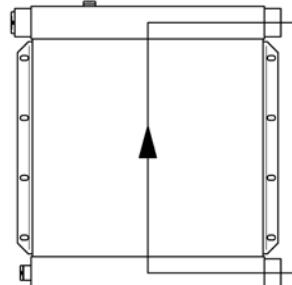
Star connection

Fig. 11:

Hydraulic connection
One-way radiator
(ACN-5-1 bis ACN-100-1)



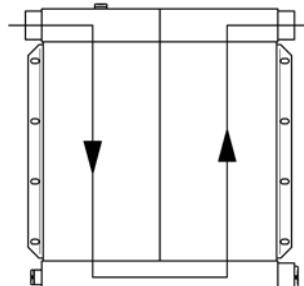
Variant a (Standard)



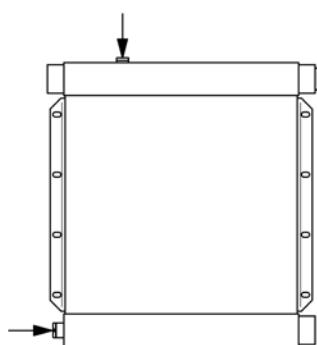
Variant b (reduced cooling performance)

Fig. 12:

Hydraulic connection
Two-way radiator
(ACN-5-2 bis ACN-60-2)

**Fig. 13:**

Measurement ports



Illustrations

Fig. 14:
Dismantling the radiator

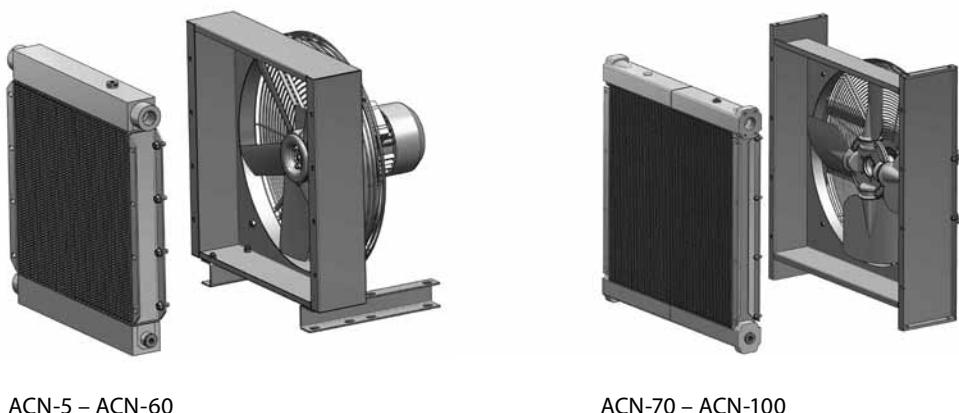


Fig. 15:
Dismantling the electric motor ACN-5

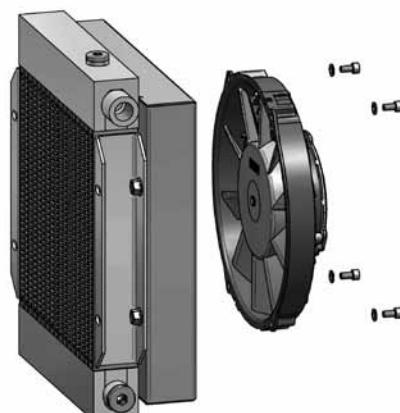
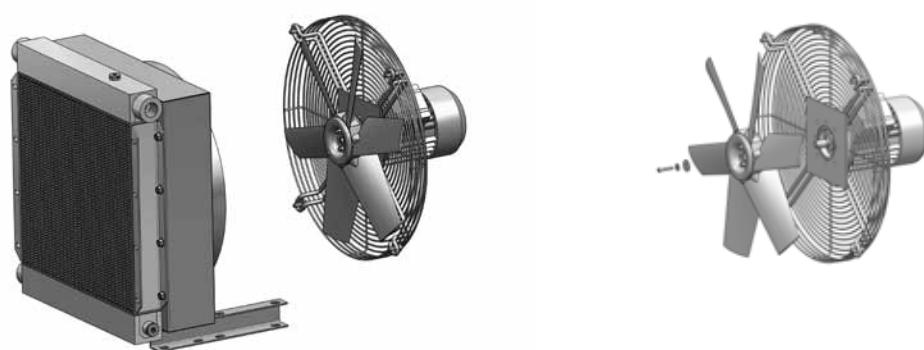


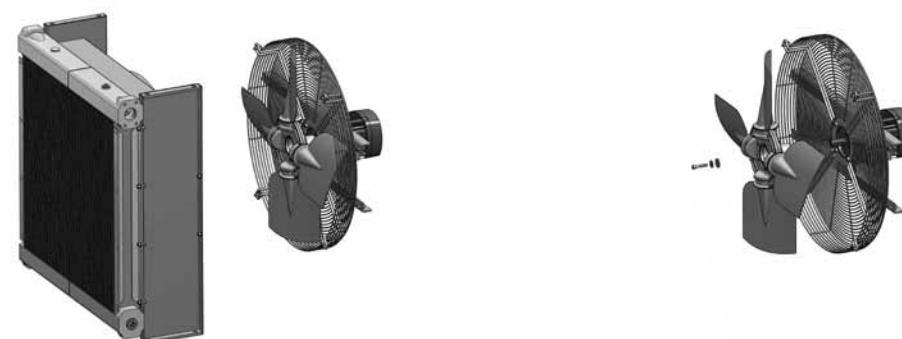
Fig. 16:
Dismantling the
electric motor
ACN-10 – ACN-60



a. Dismantling fan sub-assembly

b. Dismantling fan and protective grid

Fig. 17:
Dismantling electric motor
ACN-70 – ACN-100

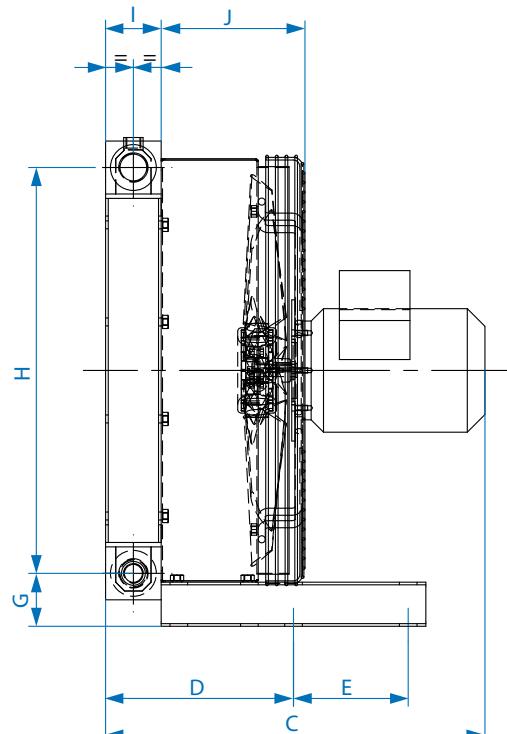
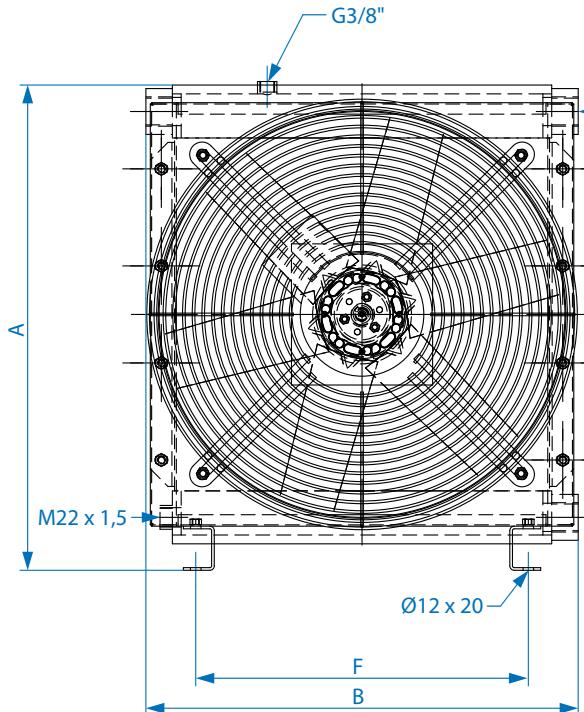


a. Dismantling fan sub-assembly

b. Dismantling fan and protective grid

Technical data and dimensions

ACN-5 – ACN-60 Dimensions



Frame size	A	B	C	D	E	F	G	H	I	J	K
ACN-5	340	300	142	*	*	272	25	290	45	97	G1/2"
ACN-10	430	347	396	199	100	239	40	360	63	128	G1"
ACN-20	430	347	426	230	100	239	40	360	94	128	G1"
ACN-30	550	490	430	213	130	377	60	460	63	163	G1"
ACN-40	550	490	461	244	130	377	60	460	94	163	G1"
ACN-50	712	670	470	213	130	554	72	610	63	183	G1 1/2"
ACN-60	712	670	500	244	130	554	72	610	94	183	G1 1/2"

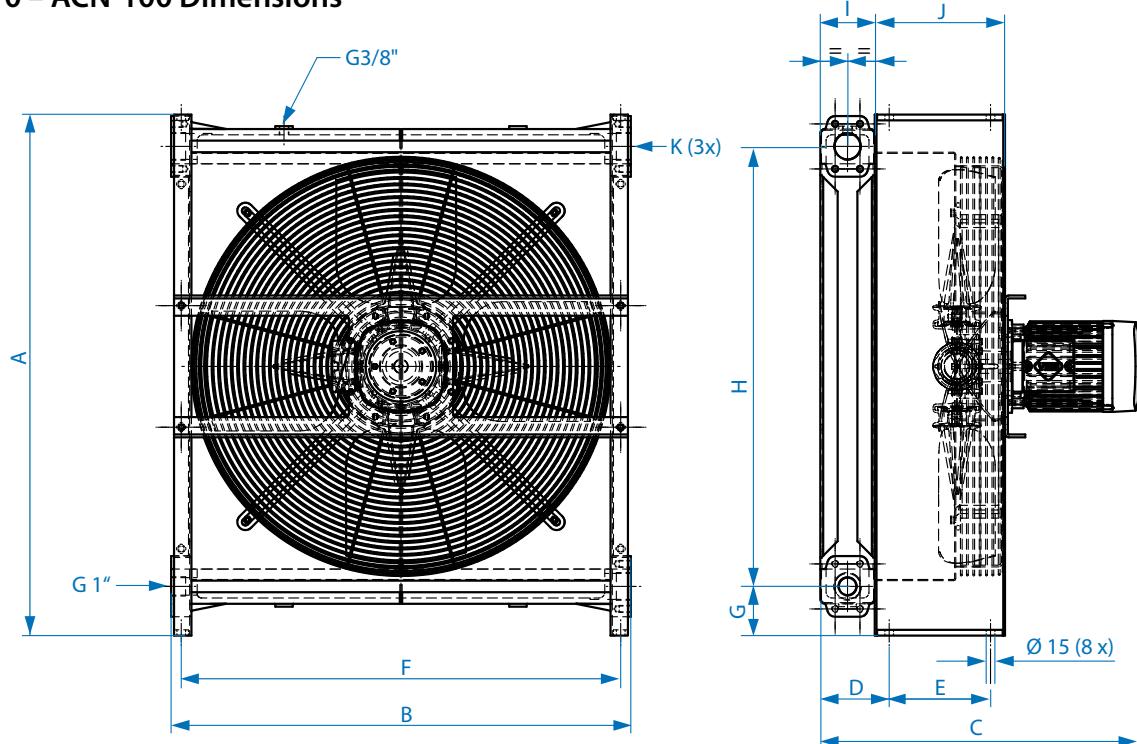
* ACN-5 without mounting brackets

Technical data

Series	Motor	Power consumption	Airflow	Noise level	Noise level	Weight	Order code
	[kW/UPM]	[A]	[m³/sec.]	1 m [dB(A)]	7 m [dB(A)]	[kg]	
ACN-5	0.11/2450	0.51	0.24	–	–	8	ACN-5-X-230.1-S
ACN-5	0.10/2500	0.2	0.23	–	–	8	ACN-5-X-400.2-S
ACN-10	0.37/3000	1	0.41	74	57	17	ACN-10-X-400.2-S
ACN-10	0.25/1500	0.8	0.24	61	44	17	ACN-10-1-400.4-S
ACN-20	0.37/3000	1	0.42	76	59	20	ACN-20-X-400.2-S
ACN-30	0.25/1500	0.8	0.62	70	53	25	ACN-30-X-400.4-S
ACN-30	0.18/1000	0.7	0.49	62	45	26	ACN-30-1-400.6-S
ACN-40	0.25/1500	0.8	0.63	72	55	32	ACN-40-X-400.4-S
ACN-50	0.55/1500	1.5	1.42	77	60	40	ACN-50-X-400.4-S
ACN-50	0.18/1000	0.7	0.88	67	50	37	ACN-50-1-400.6-S
ACN-60	0.55/1500	1.5	1.25	77	60	49	ACN-60-X-400.4-S

Noise levels can vary by ± 3 dB (A) due to sound reflecting from nearby objects, natural frequency of the unit etc. We reserve the right to amend technical data without notice.

ACN-70 – ACN-100 Dimensions



Frame size	A	B	C	D	E	F	G	H	I	J	K
ACN-70	900	794	585	119	175	759	85	760	94	225	SAE 2" und G1 1/2"
ACN-80	1000	908	571	119	175	873	85	860	94	225	SAE 2" und G1 1/2"
ACN-90	1100	1008	647	119	200	973	85	960	94	250	SAE 2" und G1 1/2"
ACN-100	1200	1075	647	119	200	1040	85	1060	94	250	SAE 2" und G1 1/2"

Technical data

Series	Motor [kW/UPM]	Power consumption [A]	Airflow [m³/sec.]	Noise level 1 m [dB(A)]	Noise level 7 m [dB(A)]	Weight [kg]	Order code
ACN-70	0.75/1000	2.43	1.78	77	64	91	ACN-70-1-400.6-S
ACN-70	0.37/750	1.6	1.3	69	56	91	ACN-70-1-400.8-S
ACN-80	1.1/1000	3.15	2.82	79	68	115	ACN-80-1-400.6-S
ACN-80	0.55/750	2.04	2.05	72	60	115	ACN-80-1-400.8-S
ACN-90	2.2/1000	5.35	3.6	85	72	140	ACN-90-1-400.6-S
ACN-90	1.1/750	3.25	2.56	76	64	134	ACN-90-1-400.8-S
ACN-100	2.2/1000	5.35	4.48	84	71	160	ACN-100-1-400.6-S
ACN-100	1.1/750	3.25	3.2	76	64	154	ACN-100-1-400.8-S

Noise levels can vary by ± 3 dB (A) due to sound reflecting from nearby objects, natural frequency of the unit etc. We reserve the right to amend technical data without notice.

Declaration of Incorporation under the terms of Machine Directive 2006/42/EG

Appendix II 1B Original Declaration of Incorporation

Manufacturer: R+L HYDRAULICS GmbH
Friedrichstrasse 6
58791 Werdohl
Germany

Person authorised to compile the relevant technical documentation: M. Schneweis, Product Manager
R+L HYDRAULICS GmbH
Friedrichstrasse 6
58791 Werdohl
Deutschland

Product: ACN oil-air cooler
Heat exchanger for the cooling of oil, water/glycol (glycol content > 40 %),
HFD fluids
Frame sizes ACN 5 bis ACN 100

The manufacturer hereby declares that the above-named product is 'partly completed machinery' under the terms of the Machine Directive. The product is intended exclusively for incorporation in machinery or partly completed machinery and therefore does not fulfil all the requirements of the Machine Directive.

The applied and fulfilled essential requirements of the Machine Directive for this product are listed in the Appendix to this Declaration.

The special technical documentation in accordance with Appendix VII Part B has been compiled. The person authorised to compile the technical documentation undertakes to transmit relevant information to the national authorities in response to any reasoned request. Documentation may be transmitted by normal mail in hard copy form, or via electronic data media.

The product must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machine Directive.

The above-named product fulfils the requirements of the following relevant directives:

Pressure Equipment Directive 97/23/EG
Low Voltage Directive 2006/95/EG
Machine Directive 2006/42/EG
Regulation 327/2011 to ERP-Directive 2009/125/EG

Werdohl, 20.09.2012



Lothar Gädtke, Managing Director

Number Appendix I	Description	Applied	Fulfilled	Remarks
1.	Essential health and safety requirements			
1.1.2.	Principles of Safety Integration	x	x	
1.1.3.	Materials and products	x	x	
1.1.4.	Lighting	x	x	
1.1.5.	Design of machinery to facilitate its handling	x	x	
1.1.6.	Ergonomics	x	x	
1.3.	Protection against mechanical hazards	x	x	
1.3.1.	Risk of loss of stability	x	x	
1.3.2.	Risk of break-up during operation	x	x	
1.3.3.	Risks due to falling or ejected objects	x	x	
1.3.4.	Risks due to surfaces, edges or angles	x	x	
1.3.7.	Risks related to moving parts	x	x	
1.3.8.2.	Moving parts involved in the process	x	x	
1.3.9.	Risks of uncontrolled movements	x	x	
1.4.	Requirements for guards and protective devices	x	x	
1.4.1.	General requirements	x	x	
1.4.2.	Special requirements for guards	x	x	
1.4.2.1.	Fixed guards	x	x	
1.5.	Risks due to other hazards	x	x	
1.5.1.	Electricity supply	x	x	
1.5.3.	Energy supply other than electricity	x	x	
1.5.4.	Errors of fitting	x	x	
1.5.5.	Extreme temperatures	x	x	
1.5.8.	Noise	x	x	
1.5.9.	Vibrations	x	x	
1.6.	Maintenance	x	x	
1.6.1.	Machinery maintenance	x	x	
1.6.4.	Operator intervention	x	x	
1.6.5.	Cleaning of internal parts	x	x	
1.7.	Information	x	x	
1.7.1.	Information and warnings on the machinery	x	x	
1.7.2.	Warning of residual risks	x	x	
1.7.4.	Instructions	x	x	
1.7.4.1.	General principles for the drafting of instructions	x	x	
1.7.4.2.	Contents of the instructions	x	x	
1.7.4.3.	Sales literature	x	x	